

DETAILED ACTION

Claim Objections

1. **Claim 16** is objected to because of the following informalities: spelling error of "glycolate". Appropriate correction is required.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 1-14 and 16-21** are rejected under under 35 U.S.C. 102(b) as being anticipated by Gutmann(in Textile Praxis International 1,1989,pp. 29-33).
3. Gutmann teaches a catalyst system comprised of a titanium/ alkali metal or alkaline earth metal complex used in polymerization and esterification of ethylene terephthlate (PETP). Titanium glycolate is one of the preferred titanium alkoxides to be used with sodium glycolate. The catalyst complex has a ratio of 1:1 titanium/metal, which is "about 1:25:1" as claimed. The composition of the catalyst taught by Gutmann is encompassed by the instant claim.

4. **Claims 1 to 3 and 16** are rejected under 35 U.S.C. 102(b) as being anticipated by Sublett (5,017,680).
5. Sublett teaches a catalyst system comprised of a titanium/ alkali metal or alkaline earth metal complex to reduce the quantity of acetaldehyde and yellowness in polymerization and esterification of Ethylene terephthalate. Titanium glycolate is one of the preferred titanium alkoxides to be used with sodium salt dissolved in ethylene glycol, which results in sodium glycolate. The catalyst complex has a ratio of 4:1 titanium/metal. The composition of the catalyst taught by Sublett encompasses the instant claim. (Col.2, line10, Col3 line 50 and Col.7, line 15).
6. **Regarding Claim 3.** It is rejected as Sublett teaches a ratio of at least of 4:1 or greater of titanium/metal. The mole ratio is within the range of the instant claim of 1.25:1 to about 10:1. (Col 3, line 50-55).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 4-14 and 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gutmann or Sublett as applied to claim 1 above, and further in view of Putzig (6.066,714).
9. Gutmann and Sublett disclose a complex catalyst of titanium glycolate with an alkali or alkali earth metal glycolate for preparing polyesters from dimethyl terephthalate which results in fast reaction rates and reduces acetaldehyde generation rate but do not

disclose using the catalyst to prepare polyesters from a dicarboxylic acid and ethylene glycol.

10. Putzig teaches polyesters produced from transesterification of dialkyl terephthalate ester with a glycol by direct esterification of terephthalic acid followed by condensation with a catalyst in esterification, transesterification or polycondensation steps. Putzig teaches a detailed processes of esterification, transesterification, polymerization or combination thereof, using a titanium containing catalyst composition (Col 1-7).

11. It would have been obvious to one of ordinary skill in the art to use the complex catalyst taught by Gutmann or Sublett to make a polyester by contacting a dicarboxylic acid such as terephthalic acid and ethylene glycol with the catalyst complex as an alternative process for making polyester, as Putzig teaches that polyesters are made by either trans-esterification of dialkyl terephthalate ester (such as dimethyl terephthalate) with a glycol or by direct esterification of terephthalic acid with a glycol. The use of the catalyst complex of Gutmann or Sublett in either process of making polyesters would have been obvious to one of ordinary skill in the art, as suggested by Putzig.

12. Putzig teaches esterification process of any carbonyl compound which can react with an alcohol to produce an ester; such carbonyl compounds, include, but are not limited to, acids, esters, amides, acid anhydrides, acid halides, oligomers or polymers having repeat units derived from an aid, or combination of two or more thereof. Organic acid having the formula of $\text{HO}_2\text{CA}^1\text{CO}_2\text{H}$ (a dicarboxylic acid) in which A^1 is an alkenyl or aryl with 1 to about 30 carbons, preferably 4 to 15 carbons with an alcohol, which has

the formula of $R(OH)_n$, or an alkylene glycol of the formula $(HO)_nA(OH)_n$ or combination thereof in which R can be the same or different hydrocarbyl radical with preferably 1 to about 8 carbons per radical (Col 6, line 25-67).

13. Regarding Claim 8, Putzig teaches esterification process using an alcohol and an oligomer having repeating units derived from an organic acid or ester (Col 6, line 15).

14. Regarding Claims 11 to 13, Putzig specifically teaches a process temperature of 250-300C under a pressure of 0.001 to about 10 atmospheres, with a molar ratio of the alcohol to the carbonyl compound of 1:1 to 10:1. The teachings encompass the instant claims (Col 7, line 22-35).

15. Regarding Claim 14 and 19 to 21, Sublett specifically teaches a concentration of about 10-100ppm prior to addition to the reaction mixture or in situ i.e., in the process feed (Col 5, line11). The concentration of the catalyst revealed by Sublett encompasses the concentration of the instant claims.

16. Regarding Claim 18, It is rejected as Putzig specifically teaches a ratio of 1:1 to about 3:1 of alcohol to dicarboxylic compound (Col 7, line3).

Conclusion

17. The prior arts made of record and not relied upon are considered pertinent to applicant's disclosure. Endo (JP57108126) and Asahi(JP 71014025).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to COLETTE NGUYEN whose telephone number is

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(571)270-5831. The examiner can normally be reached on Monday-Thursday, 10:00-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer Mc Neil can be reached on (571)-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/COLETTE NGUYEN/
Examiner, Art Unit 4162

CN
June 18, 2008

/Melvin C. Mayes/
Primary Examiner, Art Unit 1791